APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,290	04/06/2001	James Howard Goodnight	343355600013	6589

		EXAMINER
7590	12/28/2004	HIRL, JOSEPH P

Jones, Day, Reavis & Pogue
North Point
901 Lakeside Avenue
Cleveland, OH 44114

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.		Applicant(s)	
Office Action Summary	09/828,290		GOODNIGHT ET AL.	
	Examiner		Art Unit	
	Joseph P. Hirl		2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 April 2001</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-69</u> is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>39-57</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☒ Claim(s) <u>1-38 and 58-69</u> are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>06 April 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. <u>122104</u> .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-69 are pending in this application.

Claim Restriction

2.   During a telephone conversation with applicant's attorney, John V. Biernacki, on

December 20, 2004, a provisional election was made without traverse to prosecute the

invention of building an artificial neural network, claims 39-57. Affirmation of this

election must be made by applicant in replying to this Office action. Claims 1-38 and 58-

69 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as

being drawn to a non-elected invention.

Claim Objection

3.   Claim 41 is objected to under 37 CFR 1.75(c), as being of improper dependent

form for failing to further limit the subject matter of a previous claim. Applicant is

required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

dependent form, or rewrite the claim(s) in independent form. The limitations of claim 41

are the same as the related limitations of claims 39 and 40.

        This objection must be corrected.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 39-57 are rejected under 35 U.S.C. 102(b) as being anticipated by

Mehrotra et al (MIT Press 0-262-13328-8, referred to as **Mehrotra**).

Claim 39

Mehrotra anticipates retrieving an input data set that includes observations and

at least one target for the observations (**Mehrotra**, p 25, l 1-9); reducing the input data

set such that the reduced input data set contains a number of points less than the

number of observations (**Mehrotra**, p 86, l 25-34); optimizing parameters of the

candidate activation functions with respect to the reduced input data set through use of

an objective function (**Mehrotra**, p 76, Fig. 3.5; Examiner's Note (EN): Para 8 applies;

while the caption of Fig. 3.5 indicates that each node has the same activation function δ,

such activation functions include unique weighting of input parameters which thereby

differentiate one node from the other and establish different functions); generating

results for each of the candidate activation functions using the optimized parameters of

the candidate activation functions and the reduced input data set (**Mehrotra**, p 76, Fig.

3.5); selecting a first activation function from the candidate activation functions based

upon the generated simulated results (**Mehrotra**, p 76, Fig. 3.5, l 7); using the selected

first activation function within a first layer of the artificial neural network (**Mehrotra**, p 76,

Fig. 3.5, I 7), wherein residuals result from predictions by the first layer's selected

activation function of the target (**Mehrotra**, p 76, Fig. 3.5, I 10); and selecting a second

activation function from the candidate activation functions to form a second layer based

upon the second activation function's capability to predict the residuals (**Mehrotra**, p 76,

Fig. 3.5, I 12; EN: Para 8. applies; this claim involves the training of a neural network

wherein the objective function is the mean square error function and the activation

functions embody a function that includes weighting of the input parameters or values at

the input, hidden and output (layers or stages)).

Claim 40

Mehrotra anticipates the candidate activation functions differ in function type

from each other (**Mehrotra**, p 76, Fig. 3.5; EN: weights to a node will modify the

function, creating a different function).

Claim 41

Mehrotra anticipates a first candidate activation function type is used within a `

first layer of the artificial neural network, wherein a second candidate activation function

type is used within a second layer of the artificial neural network, wherein the first

candidate activation function type is a different function type than the second candidate

activation function type (**Mehrotra**, p 76, Fig. 3.5; EN: Para 8 applies; weights to a node

will modify the function, creating a different function).

Claim 42

Mehrotra anticipates determining principal components for the input data set

(**Mehrotra**, p 85, 86, Section 3.4.6; EN: such are hyperplane and clusters);

selecting the principal components, that are substantially correlated to the target

(**Mehrotra**, p 87, Fig. 3.11); and generating a frequency table that describes frequency

relationships between values of the selected principal components and the inserted

points (**Mehrotra**, p 86, l 3-8; EN: a cluster represents a frequency table).

Claim 43

Mehrotra anticipates determining which of the candidate activation functions to

use within a layer of the artificial neural network by using the frequency relationships

(**Mehrotra**, p 86, l 3-8; EN: candidate activation functions are set by weights).

Claim 44

Mehrotra anticipates determining parameters of the candidate activation

functions by optimizing the candidate activation functions with respect to a

predetermined objective function (**Mehrotra**, p 76, l 12); selecting which of the

candidate activation functions to use within a layer of the artificial neural network

(**Mehrotra**, p 76, Fig. 3.5; EN: set by weights); and creating a layer of the artificial

neural network with the selected candidate activation function and its respective

optimized parameters (**Mehrotra**, p 76, Fig. 3.5).

Claim 45

Mehrotra anticipates the objective function is a sum of squares error objective

function (**Mehrotra**, p 76, Fig. 3.5, l 10; p 71, l 17-18; EN: the objective function is the

error function).

Claim 46

Mehrotra anticipates the objective function is an accuracy rate objective

function (**Mehrotra**, p 71, I 28; EN: generalized delta rule is synonymous with the

accuracy rate objective function).

Claim 47

Mehrotra anticipates a layer weight is determined during the optimizing of the

candidate activation functions (**Mehrotra**, p 76, Fig. 3.5).

Claim 48

Mehrotra anticipates frequency table specifies which observations of the

selected principal components is accorded a greater weight during the optimizing of the

candidate activation functions (**Mehrotra**, p 76, Fig. 3.5; p 85, 86, Section 3.4.6; EN:

clusters represent frequency that are derived from the input data (principal components)

through the weighting of the nodes at various levels).

Claim 49

Mehrotra anticipates generating prediction outcomes for each of the candidate

activation functions (**Mehrotra**, p 76, Fig. 3.5, I 7); and selecting one of the candidate

activation functions to use within a layer of the artificial neural network based upon the

generated prediction outcomes (**Mehrotra**, p 76, Fig. 3.5, I 10).

Claim 50

Mehrotra anticipates the optimized parameters of the candidate activation

functions are used to generate the prediction outcomes (**Mehrotra**, p 76, Fig. 3.5).

Claim 51

Mehrotra anticipates the prediction outcomes are generated by testing each of the candidate activation functions with the principal components and the observations (**Mehrotra**, p 76, Fig. 3.5; EN: such is training).

Claim 52

Mehrotra anticipates the observations are passed through a linking web into each of the candidate activation functions to evaluate fit of the prediction outcomes to an evaluation data set (**Mehrotra**, p 76, Fig. 3.5).

Claim 53

Mehrotra anticipates the input data set is used as the evaluation data set for determining a first stage of the artificial neural network (**Mehrotra**, p 76, Fig. 3.5: EN: stage and layer are synonymous).

Claim 54

Mehrotra anticipates residuals from the first stage are used as the evaluation data set for determining a second stage of the artificial neural network (**Mehrotra**, p 76, Fig. 3.5; p 86, l 3-8).

Claim 55

Mehrotra anticipates residuals from the second stage are used as the evaluation data set for determining a third stage of the artificial neural network (**Mehrotra**, p 86, l 3-8; EN: the third stage is the output layer).

Claim 56

Mehrotra anticipates the parameters of the candidate activation functions are

generated substantially in parallel (**Mehrotra**, p 86, l 3-8).

Claim 57

Mehrotra anticipates the prediction outcomes for the candidate activation

functions are generated substantially in parallel (**Mehrotra**, p 86, l 3-8).

Examination Considerations

6.   The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light

of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44USPQ2d 1023,

1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in

the claim are not read into the claim. *In re Prater,* 415 F.2d, 1393, 1404-05, 162 USPQ

541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The

Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the

art. Such an approach is broad in concept and can be either explicit or implicit in

meaning.

7..   Examiner's Notes are provided to assist the applicant to better understand the

nature of the prior art, application of such prior art and, as appropriate, to further

indicate other prior art that maybe applied in other office actions. Such comments are

entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

8.   Examiner's Opinion: Paras 6 and 7 apply. Limitations appearing in the specification but not recited in the claim are not read into the claim.

Conclusion

9.   The prior art of record and not relied upon is considered pertinent to applicant's disclosure.

- Kramer et al, U. S. Patent 5,335,291

- Barr et al, U. S. Patent 5,761,442

10.   Claims 39-57 are rejected.

Correspondence Information

11.   Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner, Joseph P. Hirl, whose telephone number is (571) 272-3685. The Examiner can be reached on Monday – Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, Anthony Knight can be reached at (571) 272-3687.

Any response to this office action should be mailed to:
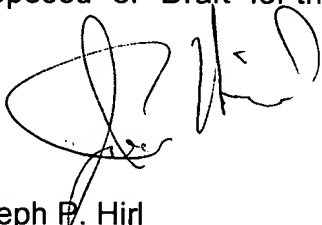
Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 872-9306 (for formal communications intended for entry);

or faxed to:

(571) 273-3685 (for informal or draft communications with notation of

"Proposed" or "Draft" for the desk of the Examiner).

Joseph P. Hirl

December 21, 2004